

**REMARKS**

**I. Introduction**

For at least the reasons set forth below, Applicants respectfully submit that all pending claims are patentable over the cited prior art references.

A Request for Continued Examination is being filed concurrently herewith.

**II. The Rejection Of Claim 107 Under 35 U.S.C. § 103**

Claim 107 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Fuller et al. (USP No. 6,068,941) in view of JP 11-67252. Applicants respectfully traverse this rejection for at least the following reasons.

Amended claim 107 recites a method for operating a fuel cell...comprising the steps of carrying out a restoring operation including: (A) operating the fuel cell while feeding the oxygen-containing gas to the cathode, (B) terminating feeding of the oxygen-containing gas to the cathode, and (C) feeding a hydrocarbon gas that is a city gas desulfurized with a desulfurizer, a propane gas or a butane gas to the cathode instead of the oxygen-containing gas which has been fed to the cathode, to decrease a potential of the cathode after terminating feeding of the oxygen-containing gas to the cathode.

A feature of the present disclosure is the step of terminating feeding of the oxygen-containing gas to the cathode. Applicants argued in the previous response that Fuller teaches that air is fed to the cathode at time of start up and as such, does not teach the step of terminating feeding of the oxygen-containing gas to the cathode and feeding a hydrocarbon gas that is a city

gas, propane gas or butane gas after terminating feeding of the oxygen-containing gas to the cathode.

It is now alleged in the present Office Action that with regard to the above limitation, “it does not really add anything of significance to the patentability of the claimed method” because the method is directed to a shut down operation. Therefore, the Examiner argues that the fact that Fuller teaches feeding an oxidant to the cathode at start up is completely irrelevant to the claimed invention.

However, the Examiner made it relevant by arguing this fact in the previous Office Action. The Examiner argued in that Office Action that since start up follows termination, then if oxidant is added during start-up, it is present after termination. The Applicants’ argument shows that since Fuller teaches feeding oxidant to the cathode at start-up, then Fuller cannot teach feeding a hydrocarbon gas after termination. As such, the fact that Fuller teaches adding oxidant at start up is not irrelevant, as the Examiner attempted to utilize this fact against Applicants. Accordingly, it is clear that Fuller fails to teach the limitation of claim 107 of a step of terminating feeding of the oxygen-containing gas to the cathode.

Another feature of the present disclosure is the step of feeding a hydrocarbon gas that is a city gas desulfurized with a desulfurizer, a propane gas or a butane gas to the cathode instead of the oxygen-containing gas. As a result of this feature, a restoring operation for restoring performance of the cathode can be carried out.

It is admitted in the Office Action that Fuller fails to disclose supplying a hydrocarbon gas that is a city gas desulfurized with a desulfurizer, a propane gas or a butane gas to the cathode instead of the oxygen-containing gas. However, it is alleged that JP ‘252 “divulges the

use of city gas being reformed in a reformer 22 wherein part of the combustion exhaust gas from the reformer 22 is supplied...as a purge gas with a purge gas blower 38.

However, the combustion exhaust gas disclosed in JP '252 is not a fuel gas which is fed to the city, home or plant. In Japan, the term "city gas" has two meanings. In the reference Kojien, page 1732, published on October 6, 1986, which is included as "Reference 1" with this response, the term "city gas" means a gas fed to a town as a fuel and is distinguished from a propane gas, or like. However, in the reference Nihongo Dai Jiten, pages 1399-1400, published on January 28, 1992, which is included as "Reference 2", the term "city gas" means fuel gas which is fed to home, plants, etc. and is a coal gas, a petroleum gas, or a liquefied natural gas, or a gas created by mixing them such that the resulting gas mixture has desired calories, or means a town gas.

Thus, according to these two definitions, the "city gas" is a fuel gas which is fed to town, home or plants. In contrast, the term "combustion exhaust gas" in JP '252 is not a fuel gas which is fed to the city, home or plant. As such, JP '252 does not disclose the limitation of feeding a hydrocarbon gas that is a city gas desulfurized with a desulfurizer, a propane gas or a butane gas to the cathode instead of the oxygen-containing gas. Moreover, "city gas" is capable of restoring the cathode, as described in Example 12 of the present specification. In contrast, "combustion exhaust gas" typically contains oxygen fed at the time of combustion, and the oxygen oxidizes the cathode. Therefore, the combustion exhaust gas is not suitable as the purge gas, as suggested by the Examiner.

Moreover, it is alleged that “there is no dispute that the city gas of JP ‘252 is fed to the anode”. Applicants respectfully disagree. Rather, JP ‘252 teaches that the anode gas obtained by reforming the city gas is fed to the anode. As such, the city gas is not fed to the anode.

Furthermore, it is alleged that “there is also no dispute what is the intended use of the city gas in the JP’252 which is to act as a purging gas, and not as a fuel or reactant”. Applicants again respectfully disagree. JP ‘252 discloses that a combustion exhaust gas, not a city gas, is fed to a housing 21. The fact that air exists outside the housing 21 and accordingly, the city gas leaks from the housing 21, was commonly known to those skilled in the art at the time of filing JP ‘252. Therefore, it was difficult to practice purging the housing with city gas, because of a safety problem. For this reason, feeding the city gas as a purge gas was not only not an intended use, but a very dangerous practice. As such, JP ‘252 does not use the city gas in JP ‘252 as a purging gas.

It is also alleged in the Office Action that “it is teaching and only this teaching what prompts the examiner to maintain the above-noted rejection on the ground that if city gas is employed for purging the fuel cell cathode, why cant it (the city gas) be used to purge the fuel cell cathode in a similar fashion in view of settled law (KSR) which supports obviousness rejection based on yielding predictable result.

However, the only predictable result from utilizing the Examiner’s suggestion to feed city gas to the cathode would result in combustion of the city gas and oxygen and therefore damage to the cathode. As such, Applicants submit that the obviousness finding is improper. Accordingly, based on the Examiner’s own admission, there is no support or rationale for further maintaining the rejection.

In order to establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. As Fuller and JP 11-67252, at a minimum, fail to describe a method for operating a fuel cell...comprising the steps of carrying out a restoring operation including: (A) operating the fuel cell while feeding the oxygen-containing gas to the cathode, (B) terminating feeding of the oxygen-containing gas to the cathode, and (C) feeding a hydrocarbon gas that is a city gas desulfurized with a desulfurizer, a propane gas or a butane gas to the cathode instead of the oxygen-containing gas which has been fed to the cathode, to decrease a potential of the cathode after terminating feeding of the oxygen-containing gas to the cathode, it is submitted Fuller and JP 11-67252, alone or in combination, do not render claim 107 obvious. Accordingly, it is respectfully requested that the § 103 rejection of claim 107 be withdrawn.

### **III. Conclusion**

Having fully responded to all matters raised in the Office Action, Applicants submit that all claims are in condition for allowance, an indication of which is respectfully solicited.

**Application No.: 10/696,505**

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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